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A.D. 1913

DUPLICATE

*Date of Application, 8th Feb., 1913**Complete Specification Left, 8th Aug., 1913—Accepted, 9th Feb., 1914*

PROVISIONAL SPECIFICATION.

An Improvement in or in connection with Pneumatic Tyres.

I, THOMAS MORRIS, of 33, Wollaston Road, Cleethorpes, in the County of Lincoln, Engineer, do hereby declare the nature of this invention to be as follows:—

5 This invention relates to an improvement in or in connection with pneumatic tyres for the wheels of motor and other road vehicles, cycles and the like.

When a pneumatic tyre is in position on a wheel and is inflated for running purposes, even if the air pressure inside the tyre is considerably greater than that of atmospheric pressure, say for example, is 60 lbs. to the square inch, that part of the tyre which is in contact with the road, is assuming for example that
10 the tyre is fitted on the wheel of a motor car, flattened by the weight of the car itself and is caused to bulge out at the sides, and is still further flattened on additional weight being added, as say, by one or more persons being in the car, this flattened portion of the tyre exerting a pull or sucking action on the road which has to be overcome by the engine of the car; furthermore when the car
15 is going round curves or taking corners, there is a twisting of certain of the tyres which further squeezes such tyres out of shape and to one side of the wheel rims, this constant compressing and squeezing from side to side of the tyres causing what may be called a "chewing" action on the air tube which heats the tube and causes it to lose its nature, and when both an air tube and a cover are
20 employed, both the air tube and the cover, and causes premature destruction of the tyre.

The object of the present invention, is to provide the outer part or cover of the tyre, or the tube itself, if the tyre is of the single tube type, with means whereby when the tyre is inflated it is almost if not entirely prevented from being compressed and from being squeezed out of shape and to one side of the wheel rim
25 when running, and is in fact caused to retain its normal shape or practically its normal shape under all but the most exceptional circumstances or conditions.

The present invention consists in providing the cover of the tyre, or if the tyre is of the single tube type, the tube itself, with two or more strong metal preferably endless rings either made of strong wire or of steel or the like, or with strong rings of cord, folded canvas or fabric or the like, which are incorporated in or suitably secured to the sides of the tyre cover or to the tube itself when the tyre is of the single tube type, preferably midway or about midway between the tread or periphery and the wire or beaded or like edges of the said cover or
30 tube, and one or more at each side of such cover or tube. When wire or other metal rings are employed they may be secured in or to the sides of the cover or tube by any suitable means, one and a convenient means which I describe by way of example only, consisting in folding one or more layers of the fabric which is commonly employed in the manufacture of tyres, around the said rings
35 and in moulding the same in the tyre cover or tube whereby when the tyre is vulcanized the rings are incorporated in the cover or tube; I may however place them at the outside of the cover or tube and wrap them with fabric and cover them with rubber or rubber composition and cause them to become a part of the cover or tube by vulcanization.

[Price 8d.]

An Improvement in or in connection with Pneumatic Tyres.

When rings of stout cord, folded or rolled fabric or the like are employed in place of metal rings, such cord, fabric or the link rings may be incorporated in, or secured to the cover or tube in any suitable way, as for instance in the manner before-described with reference to metal rings.

By providing the cover or tube with strong rings in accordance with my invention, whenever the tyre moves as a result of either vertical or side compression, these rings are subjected to the same movement and are thus always subjected to a high tension, hence when the tyre is carrying its full load and is liable to be compressed at the bottom owing to contact with the ground, the rings by crossing the point where the compression would take place, distributes what would otherwise be compression or flattening of one part only, entirely over the whole of the tyre, consequently there is practically no flattened portion at the point where the tyre is in contact with the road and the tyre presents at all times a rounded or practically rounded surface to the road.

Dated the Seventh day of February, 1913.

LOUIS E. KIPPAX,
Gough Chambers, Savile Street, Hull,
Patent Agent for the Applicant.

COMPLETE SPECIFICATION.

An Improvement in or in connection with Pneumatic Tyres.

I, THOMAS MORRIS, of 33, Wollaston Road, Cleethorpes, in the County of Lincoln, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to an improvement in or in connection with that kind of pneumatic tyres for the wheels of motor and the like road vehicles, cycles and the like which are fortified by means of rings of wire, wire fabric, rope, webbing or the like inserted in the walls of the tyre cover between the beaded or enlarged edges and the crown of the cover, for the purpose of strengthening such cover and preventing side expansion of the tyre.

In tyres of the kind referred to the rings are either enclosed within pockets in the walls of the cover or tube or are secured in such cover or tube by having fabric folded around them, said rings being, in the latter case supported by the fabric from the beaded or like edges of the cover, which arrangement allows, to a greater or less extent, of the distortion of that part of the tyre between the point at which the rings are situated and the crown or tread of the tyre.

The present invention consists in so securing the rings in the cover, or in the tube, if the tyre is of the single tube type, by means of fabric folded around them and carried up to or around the crown or tread, but enclosed within the rubber or the like of which the cover or tube is composed, that the said rings are what may be called "suspended" from the crown or tread of the cover or tube, as the case may be, in place of from the beaded or like edges of the same, midway between such crown or tread and the beaded or like edges whereby any distortion of the tyre that takes place (which will be exceedingly small) is distributed evenly over the entire surface of the tyre, so ensuring the tyre always presenting a rounded, or practically rounded surface to the road.

In the accompanying drawing, Fig. 1 represents a transverse section of part of a wheel rim and part of a tyre of ordinary construction applied thereto in its normal state when inflated, and also shews diagrammatically, two of the many distorted shapes which such tyre assumes when in use, and Fig. 2 is a transverse section of a portion of a tyre with my improvement applied to the cover

An Improvement in or in connection with Pneumatic Tyres.

thereof, such figure being drawn to a larger scale than Fig. 1 thereby to allow of my improvement being more clearly shewn.

Referring to Fig. 1 of the drawing, the object of which is to illustrate the normal shape of an ordinary construction of pneumatic tyre when inflated and not bearing any weight, and how it is distorted and squeezed out of shape when it is in use, the full lines A shew the normal shape of the tyre when it is inflated but is not bearing the weight of a load, the broken lines B shew the shape that part of the tyre which is in actual contact with the road approximately assumes when in use and bearing an average weight and assuming it is running on a perfectly level and straight road, obviously however, the shape of the tyre continually changes from the shape indicated by the said lines B to the shape indicated by the lines A consequent on the changes there are in the nature of the road surface and the speed at which the vehicle is travelling, and the broken lines C shew the approximate shape the tyre assumes when running on a road which has a side slope, as have all good roads, or when the vehicle is going around corners, or when it is swaying about or swerving to avoid traffic.

The present invention has for its object, as before mentioned, to prevent this distortion of the tyre, and to that end, consists in providing the cover 1 of the tyre, or if the tyre is of the single tube type, the tube itself, with two or more strong preferably endless rings 2, 3 either made of strong wire, or of steel or the like, or with strong rings of cord, folded canvas or fabric or the like, which are incorporated in, or secured to the sides of the tyre cover 1, or if the tyre is of the single tube type, in or to the tube itself, midway between the tread or periphery 4 and the wired or beaded or like edges 5, 6 of the said cover or tube, and one or more at each side of such cover or tube.

According to this invention, the rings are secured in or to the sides of the cover or tube by folding or wrapping one edge of a piece or pieces of fabric 7 cut on the bias, around the ring intended for one side of the tyre and the other edge of such piece or pieces around the ring intended for the other side of the tyre, by passing such edges through the rings from one side, turning them up at the other side of the rings and then securing the upturned edges to the body of the fabric by means of rubber solution or the like, any suitable number of pieces of fabric being used, the fabric with the rings being moulded into the tyre cover, or the tube, as the case may be, with the rings "suspended" by means of the fabric, from the tread or crown portion of the cover or tube midway between the crown and the beaded or like edges of the cover or tube, as will be seen by referring to Fig. 2 of the drawing, and the whole vulcanised, the rings and fabric being thus incorporated in the tyre cover, or the tube, as the case may be.

In place of the same piece or pieces of fabric being used to wrap and so support the rings at both sides of the tyre, a separate piece or pieces may be employed for each ring, the free edge of the piece or of each piece which carries one ring being preferably arranged to overlap the free edge of the piece or pieces which carry the other ring.

I may however place the rings at the outside of the cover or tube and enclose them within the edges of fabric or the like in the manner before described, and cover the whole with rubber or rubber composition with or without an additional layer or layers of fabric or the like, the rings with the fabric being placed over the outside of the cover or tube, which has been already formed by moulding or other suitable means, for the rings to be situated midway between the crown or tread of the cover or tube and the beaded or like edges of the same, the whole being then subjected to vulcanisation whereby the rings and the fabric or the like become an actual part of the cover or tube.

By providing the cover or tube of a pneumatic tyre with strong rings suspended in accordance with my invention, the tyre is considerably strengthened and has increased rigidity imparted to it, and whenever the tyre moves as a result

An Improvement in or in connection with Pneumatic Tyres.

of either vertical or side compression, these rings are subjected to the same movement and are consequently always subjected to a high tension, hence, when the tyre is carrying its full load and is liable to be compressed at the bottom owing to contact with the road, the rings by crossing the point where compression would take place in tyres of the ordinary construction, distribute what 5 would otherwise be compression or flattening of one part only, over the whole area of the tyre, consequently there is extremely little flattened portion at the point where the tyre is in contact with the road, with the result that the tyre presents at all times a rounded or practically rounded surface to the road, that is, assuming of course, that it is not allowed to become unduly deflated. 10

I am aware that in a pneumatic tyre cover having edges adapted the one to overlap the other, or the one to engage the other, the said edges, or one of the same being provided with a steel or other inextensible band whereby the tyre is particularly adapted to fit and remain on the ordinary iron or steel hoop of a wheel without side flanges being necessary for holding the tyre on the said hoop, 15 it has been proposed to provide the said cover with side rings secured inside or outside said cover by canvas or the like which crosses the tread of the cover, passes round the rings and has its edges joined between the rings, the rings and canvas or the like being solutioned or otherwise permanently secured to the cover, said rings forming as it were a purchase against which the air pressure 20 can be exerted so that when the tyre is blown up the ends of the band, or bands in the edge or edges of the cover are by the air pressure forced over each other thus reducing, or tending to reduce the diameter of the said bands so that they grip the wheel the more firmly the harder the tyre is blown, but it will be seen that such rings are not used in the manner and for the purpose set out in my 25 before-going specification, and I therefore make no claim thereto, but,

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

In a pneumatic tyre of the kind fortified by means of wire or other strong side 30 rings secured to the inside or the outside of the tyre and suspended by strong canvas or the like wrapped or folded round them crossing the crown of the tyre and connecting them, the improvement wherein the rings, which may either be embodied in or secured to the outside of the walls of the cover, or if the tyre is of the single tube type embodied in or secured to the outside of the walls of the 35 tube, have strong canvas or the like wrapped or folded round them, which fabric is so arranged that it runs to or around the crown or tread portion of the cover, or of the tube, as the case may be, whereby the rings are what may be called "suspended" from such crown or tread portion midway between the peripheral 40 surface of said cover or tube and the beaded or like edges, or portions of the same which engage, or find their seat in the wheel rim, substantially as hereinbefore described with reference to Fig. 2 of the accompanying drawing and for the purpose set forth.

Dated the Seventh day of August, 1913.

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DIV. 41.

FIG. 1.

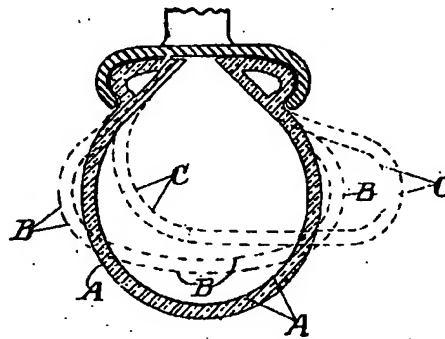


FIG. 2.

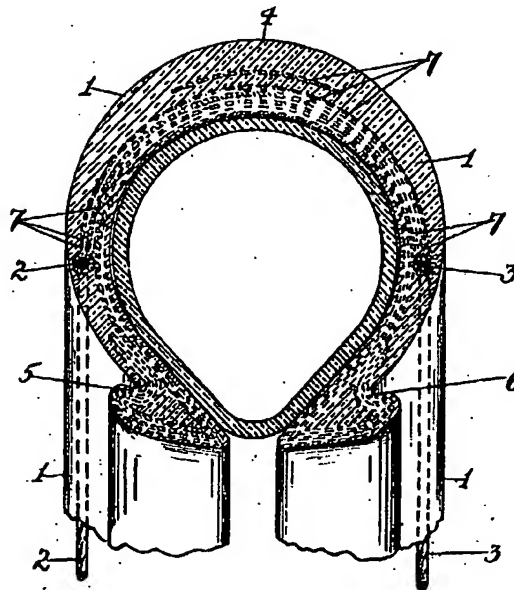


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